

WHAT IS CLAIMED IS

1. A sensing device comprising:
 - a cantilever disposed with a medium which is movable relative to the cantilever; and
 - a device associated with one of the cantilever and the medium which is responsive to changes in electrical field between the medium and the cantilever caused by a distance between the medium and the cantilever changing.
2. A sensing device as set forth in claim 1, wherein the cantilever comprises a probe which extends from the cantilever and contacts a surface of the medium having a topography that causes the distance between the cantilever and the medium to vary.
3. A sensing device as set forth in claim 1, wherein the device is a FET (Field Effect Transistor).
4. A sensing device as set forth in claim 1, wherein the device is an induced channel FET (Field Effect Transistor).
5. A sensing device as set forth in claim 3, wherein the medium is electrically non-conductive and is supported on a substrate which is electrically conductive, and wherein the substrate is circuited with the FET so that variations in the electrical field which result from a change in distance between the medium and the cantilever, induces a change in electrical current passing through the FET and produces a read signal.
6. A read mechanism used in a contact atomic resolution storage system, comprising:
 - a cantilever disposed with an electrically non-conductive medium which is movable relative to the cantilever, the cantilever having a probe which follows a topography of the medium; and

a device formed in the cantilever which responds to a change in electric field induced by a change in distance between the cantilever and a substrate on which the medium is supported.

7. A read mechanism as set forth in claim 6, wherein the device is a FET (Field Effect Transistor).

8. A read mechanism as set forth in claim 6, wherein the device is an induced channel FET (Field Effect Transistor).

9. A read mechanism used in a contact atomic resolution storage system, comprising:

a cantilever disposed with a medium which is movable relative to the cantilever, the cantilever having a probe extending from the cantilever and in contact with a surface of an electrically conductive medium to follow changes in a data indicative topography of the medium;

a circuit which establishes an electrical connection between the cantilever and substrate on which the media is supported, and generates an electric field in a gap between the cantilever and the medium; and

a device associated with the cantilever which is responsive to changes in the electric field in the air gap.

10. A read mechanism as set forth in claim 9, wherein the device is a FET (Field Effect Transistor).

11. A read mechanism as set forth in claim 9, wherein the device is an induced channel FET (Field Effect Transistor).

12. A method of using a sensing device comprising:

moving a probe supported on a cantilever relative to a medium that has a data indicative topography followed by the probe, the medium being associated with a substrate producing an electric field; and

sensing the change in distance between the cantilever and the medium using a change in current flowing through a FET (Field Effect Transistor) formed in the cantilever, wherein the change in current is induced by a change in electric field between the substrate and the FET.

13. A method as set forth in 12, further comprising using the change in electric field to sense the presence of a bit of data which is written into the medium.

14. A method as set forth in 13, further comprising using the data bit sensing in a mass storage device.

15. A method of using a sensing device comprising:
forming a FET in a first structure;
generating an electric field in a second structure which is movable with respect to the first structure; and
gating the FET using the electric field produced by the second structure and produce a signal indicative of the amount of separation between the first and second structures.

16. A method as set forth in claim 15, further comprising:
controlling the relative position between the first structure and the second structure; and
sensing data stored on the second structure using the signal indicative of the amount of separation between the first and second structures.

17. A method as set forth in claim 15, comprising using the device as a microphone.

18. A method as set forth in claim 15, further comprising using the device as an acceleration sensor.

19. A method as set forth in claim 15, further comprising using the device as a pressure sensor.
20. A method as set forth in claim 15, further comprising using the device in a position control system.
21. A method of making a sensing device comprising:
forming a cantilever;
forming a FET (Field Effect Transistor) in the cantilever;
forming an electrically non-conductive probe on the cantilever; and
adapting the probe to follow a topography of a medium which is movable relative to the probe and which is associated with a substrate which is adapted to produce an electric field which acts as a gate for the FET.
22. A method as set forth in claim 21, further comprising:
forming the medium of a thermoplastic electrically non-conductive material;
forming the medium on the substrate; and
forming the substrate of an electrically conductive material
23. A method as set forth in claim 21, comprising forming the FET with a channel.
24. A method as set forth in claim 21, comprising forming the FET as a induced channel FET.
25. A method as set forth in claim 21, further comprising connecting the medium to a drive which moves the medium with respect to the probe.
26. A sensor device comprising:
a cantilever;
a medium which is movable with respect to the cantilever;

electric field generation means disposed with a first of the cantilever and the medium for producing an electric field between the medium and the cantilever; and

FET sensing means disposed with a second of the cantilever and the medium for responding to changes in an electric field induced by a change in clearance between the medium and the cantilever.

27. A sensor device as set forth in claim 26, further comprising probe means for detecting a data indicative topography of the medium and controlling the change in clearance between the cantilever and the medium.